

STEAM CLEANING IN A DISHWASHER

## BACKGROUND OF INVENTION

## 1. Field of Invention

The present invention relates to washing tableware, pots and pans in a conventional dishwasher and, more particularly, to employing a novel prolonged steaming step at the beginning of the dishwashing process to remove baked-on food.

## 2. Art Related to Invention

Dishware, glassware, silverware, pots, pans and the like are normally washed in a dishwasher using a series of steps that include hot water, soap and heat to dry. The use of a steam cleaning or soaking step has been suggested in US Patent Nos. 2,289,890; 4,457,323; 4,279,384; 4,366,005; and 5,032,186. Generally, none of these references teach employing a prolonged steaming step at the beginning of the conventional dishwashing process.

## SUMMARY OF INVENTION

It has now been discovered that by employing a preliminary, prolonged steaming step in a dishwasher prior to the conventional dishwashing process that baked-on food is readily removed by a conventional dishwasher through the conventional washing process.

Broadly, the process of the present invention is a method for operating a conventional dishwasher comprising the steps of:

- (a) loading the dishwasher with items for washing;
- (b) closing the loaded dishwasher;
- (c) steam cleaning the items in a water saturated atmosphere at a pressure of equal to or greater than 15 psi, a temperature of equal to or greater than 100°C, a time of equal to or greater than 15 minutes; and
- (d) subsequently washing the steamed items in the dishwasher with soap and water to clean said items.

As noted above, the steaming step of the present invention is done in a conventional dishwasher prior to the conventional washing/rinsing, etc. cycles. In other words, the process of the present invention is done as a first step.

These and other aspects of the present invention may be more fully understood by reference to the following drawings and the detailed description and any examples that follows.

#### BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 illustrates a conventional dishwasher in which the process of the present invention can be conducted.

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Referring to FIG. 1, the dishwasher of the invention is designated generally by the numeral 10 and is shown for purposes of illustration as including tub 12 provided with downwardly-opening front door 14. Dishes to be washed, rinsed and dried within tub 12 are adapted to be supported therein by racks 16 and 18 accessible upon opening the front door 14. Motor-pump assembly 20 is employed to remove water from tub 20 during the conventional washing/rinsing steps and to deliver water to distributing impeller 22 which sprays the water over dishes in racks 16 and 18. If desired, a second impeller, not shown, in series with impeller 22 may be located between racks 16 and 18.

Electrical resistance heater 24 is located within tub 12 adjacent the bottom thereof and in communication with the interior of the tub, being suitably mounted on the bottom wall of the tub.

The structure of dishwasher 10 has been illustrated and described in a superficial way only merely to outline the environmental setting of the invention. It will be understood that dishwasher 10 includes numerous additional components, preferably electrically operated, for performing such functions as introducing water into tub 12 at various times during the operating cycle of the dishwasher, for draining the water from the tub after each washing or rinsing operation, for circulating heated air over

dishes in racks 16 and 18 during the drying operation, and the like. These various operations are carried out under the control of timer 26 located at the top of door 14 in the particular construction illustrated, and thermostat 28 located in the door and exposed to the temperature within the tub. The various electrically operated components of dishwasher 10, and their control elements, may be connected in a conventional manner which is well-known in the household dishwasher art, a simplified illustrative example being shown in the aforementioned.

In order to generate the steam prior to the conventional washing/rinsing/drying step of the dishwasher, any conventional method for generating steam can be employed. For example, a body of water with a surface heater, a body of water with an immersion heater or a steam nozzle injection apparatus. Using heating elements such as the one illustrated in FIG. 1 is taught in US Patent Nos. 4,457,323 or 4,279,384, both of which are incorporated herein by reference, both of which employ a heater such as heater 24 to heat a body of water and generate steam in the tub of the dishwasher. The '323 patent generates steam by positioning the heater on top of the body of water and heating only the top of the water to generate steam while the '384 patent uses an immersion heater to generate steam.

As a specific example herein, FIG. 1 illustrates a surface style heater such as the one disclosed in the '323 patent. Sump 30 holds water to a level of 32.

When the bottom of tub 12 contains a static body of water in sump 30 to level 32, heater 24 is only partially submerged and applies heat only to a surface layer of a body of water, there being no substantial application of heat to the water below such surface layer.

Alternatively, heater 24 can be positioned in sump 30 such that heater 24 is an immersion heater and is positioned below water level 32. Such is the teachings in the '384 patent.

As a further alternative, steam generating unit 40 injects steam into tube 12 by way of nozzle 42. Steam generator unit 40 is a conventional piece of equipment that is operated in a conventional manner to inject steam into tub 12.

No matter which specific steam generating mechanism is employed, timer 26 controls the length that the steaming step is conducted. The steaming is conducted for a period of time equal to or greater than 15 minutes and, more preferably, for a period of time between 15 and 30 minutes. Good results have been obtained

when steaming is conducted for a period of time between 15 and 20 minutes.

The temperature of the atmosphere in the tub must be such that the steam is maintained and the atmosphere is saturated with water. During the steaming step, the temperature of the atmosphere is equal to or greater than 100°C (212°F) and, more preferably, between 100°C (212°F) and 175°C (350°F). Good results have been obtained when the temperature is between 120°C (250°F) and 150°C (300°F).

The pressure of the atmosphere is greater than or equal to 15 psi (103,500 Pa).

The steaming step of the present invention is done first, before the conventional dishwashing cycles are run. In this way, the hard to remove, baked-on food is loosened such that the normal dishwashing cycles will remove the dirt and/or food matter from the items in the dishwasher.

The water employed for the steaming step should be clean, without food/grease particles therein. Using clean water improves the efficiency of heater 24 or steam generating unit 40.

Preferably, after the steaming step, the items are sprayed with hot water under the control of timer 26. Next, the items are subject to a conventional dishwashing operation. For example, they are subjected to a spray washing operation with detergent. Then, the items are rinsed with hot water, rinsed with a rinsing agent, and dried. Heater 24 can be used to generate the heat used for drying.

It will be understood that the claims are intended to cover all changes and modifications of the preferred embodiments of the invention herein chosen for the purpose of illustration which do not constitute a departure from the spirit and scope of the invention.